

**ATLANTIC STATES MARINE FISHERIES COMMISSION**  
**REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN**

**For Jonah Crab  
(*Cancer borealis*)**

**2023 FISHING YEAR**



Prepared by the Plan Review Team

**Approved October 2024**



*Sustainable and Cooperative Management of Atlantic Coastal Fisheries*

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**REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT  
PLAN FOR JONAH CRAB (*Cancer borealis*)**

**2023 FISHING YEAR**

**1.0 Status of the Fishery Management Plan**

<u>Year of ASMFC Plan’s Adoption:</u>	FMP (2015)
<u>Framework Adjustments:</u>	Addendum I (2016) Addendum II (2017) Addendum III (2018) Addendum IV (2022)
<u>Management Unit:</u>	Maine through North Carolina
<u>States with a Declared Interest:</u>	Maine through Virginia (Excluding Pennsylvania and DC)
<u>Active Committees:</u>	American Lobster Management Board, Technical Committee, Plan Review Team, Advisory Panel, Electronic Reporting Subcommittee, Electronic Tracking Subcommittee

**2.0 Status of the Fishery**

**2.1 Commercial Fishery**

Historically, Jonah crab was taken as bycatch in the lobster fishery; however, in the mid-2000s a directed fishery began to emerge, causing landings to rapidly increase. Throughout the 1990s, landings fluctuated between approximately 2 and 3 million pounds, and the overall value of the fishery was low. In the early 2000s landings began to increase, with over 7 million pounds landed in 2005. By 2014, landings had almost tripled to 17 million pounds and a value of nearly \$13 million. This rapid increase in landings can be attributed to an increase in the price of other crab (such as Dungeness, *Metacarcinus magister*), creating a substitute market for Jonah crab, as well as a decrease in the abundance of lobster in Southern New England, causing fishermen to redirect effort on Jonah crab. It should be noted that there is some uncertainty in the landings data—especially prior to 2008—due to species misidentification issues as well as underreporting of landings before the implementation of reporting requirements. Despite the uncertainty, the overall trend in landings is likely accurate.

Today, Jonah crab and lobster are harvested in a mixed crustacean fishery in which fishermen can target lobster or crab at different times of the year based on slight gear modifications and small shifts in the areas in which the traps are fished. While the majority of Jonah crab landings is harvested as whole crabs, fishermen from several states, including New York, Maryland and Virginia, land claws. Jonah crab claws are relatively large and can be an inexpensive substitute for stone crab claws (*Menippe mercenaria*). As a result, they can provide an important source of income for fishermen. Along the Delmarva Peninsula, small boat fishermen have historically

harvested Jonah crab claws because they do not have seawater storage tanks on board to store whole crabs.

In 2023, landings along the Atlantic Coast totaled approximately 12.4 million pounds of Jonah crab, representing \$14.1 million in ex-vessel value. Landings decreased 12% from 2022 landings of 14 million pounds, while ex-vessel value decreased 36% from the 2022 value (\$22 mil). Anecdotal information from the industry suggests that Jonah crab landings and price are highly dependent on market conditions, which have affected recent fishery trends. Almost all coastwide landings came from trap gear. The states of Massachusetts (38%), Maine (25%), and Rhode Island (18%) were the largest contributors to landings. While landings from Southern New England still comprise the majority of the total, landings from the Gulf of Maine have been increasing in the last few years (Figure 1). Please note that Massachusetts data are based on dealer reports as harvester reports were not available for this report.

## **2.2 Recreational Fishery**

The magnitude of the Jonah crab recreational fishery is unknown at this time; however, it is believed to be quite small in comparison to the size of the commercial fishery.

## **3.0 Status of the Stock**

The 2023 Jonah Crab Benchmark Stock Assessment and Peer Review Report, released in October 2023, indicates the range-wide population of Jonah crab remains above historic lows of the 1980s and 1990s. However, evidence of declining catch per unit effort (CPUE) in the fishery presents concern and uncertainty for the status of the stock.

Based on life history and fishery characteristics, the assessment divided the population into four stocks: offshore Gulf of Maine (OGOM), inshore GOM (IGOM); offshore Southern New England (OSNE) and inshore SNE (ISNE). According to the stock indicators, IGOM, OGOM, and OSNE recruit, exploitable, and spawning abundance conditions from 2019-2021 were neutral or positive relative to historical periods. Indicators generally agree across these stocks that abundance has not been depleted compared to the historic low abundance observed in the 1980s and 1990s. There are no reliable abundance indicators for the ISNE stock so no determination about the condition of this stock's abundance could be made. Young-of-the-year (YOY) settlement indicators generally show neutral conditions and do not indicate that recruitment in the GOM stocks will decline to historical lows in the near future. Settlement conditions are unknown for SNE stocks.

According to the Peer Review Panel, "Despite the limited availability of current data, there is considerable urgency for the assessment due to a very steep, three-year, decline in landings. Commercial landings have declined 51% in three years, after an unprecedented 30-fold rise in landings. Although the recent decline is not well-detected in fishery-independent stock indicators, there is some evidence of declining CPUE in the fishery, creating concern and uncertainty for the status of the stock. Given the mixed signals, the status of the Jonah crab stock is highly uncertain. The Panel strongly recommended close monitoring of annual stock indicators in the next few years.

In response to the assessment findings and peer review panel recommendations, the American Lobster Management Board accepted the Benchmark Stock Assessment and Peer Review Report for management use. The Board also tasked the Technical Committee (TC) with recommending possible measures or actions to address the concerns about stock status and recent fishery trends. The TC did not recommend any management action, but recommended that indicator data for the OSNE stock, where the majority of the fishery occurs, be updated annually, while data for the other three stock areas should be updated every five years.

#### **4.0 Status of Management Measures**

##### **Interstate Fishery Management Plan for Jonah Crab (2015)**

Jonah crab is managed under the Interstate Fishery Management Plan (FMP) which was approved by the American Lobster Management Board in August 2015. The goal of the FMP is to promote conservation, reduce the possibility of recruitment failure, and allow for the full utilization of the resource by the industry. The FMP lays out specific management measures in the commercial fishery. These include a 4.75" minimum size and a prohibition on the retention of egg-bearing females. To prevent the fishery from being open access, the FMP states that participation in the directed trap fishery is limited to lobster permit holders or those who can prove a history of crab-only pot fishing. All others must obtain an incidental permit. In the recreational fishery, the FMP sets a possession limit of 50 whole crabs per person per day and prohibits the retention of egg-bearing females. Due to the lack of data on the Jonah crab fishery, the FMP implements a fishery-dependent data collection program. The FMP also requires harvester and dealer reporting along with port and/or sea sampling.

##### **Addendum I (2016)**

Addendum I establishes a bycatch limit of 1,000 crabs per trip for non-trap gear (e.g., otter trawls, gillnets) and non-lobster trap gear (e.g., fish, crab, and whelk pots). In doing so, the Addendum caps incidental landings of Jonah crab across all non-directed gear types with a uniform bycatch allowance. While the gear types in Addendum I make minimal contributions to total landings in the fishery, the 1,000 crab limit provides a cap to potential increases in effort and trap proliferation.

##### **Addendum II (2017)**

Addendum II establishes a coastwide standard for claw harvest. Specifically, it permits Jonah crab fishermen to detach and harvest claws at sea, with a required minimum claw length (measured along the forearm of the claw) of 2.75" if the volume of claws landed is greater than five gallons. Claw landings less than five gallons do not have to meet the minimum claw length standard. The Addendum also establishes a definition of bycatch in the Jonah crab fishery, whereby the total pounds of Jonah crab caught as bycatch must weigh less than the total amount of the targeted species at all times during a fishing trip. The intent of this definition is to address concerns regarding the expansion of a small-scale fishery under the bycatch limit.

##### **Addendum III (2018)**

Addendum III improves the collection of harvester and biological data in the Jonah crab fishery. Specifically, the Addendum improves the spatial resolution of harvester data collection by

requiring fishermen to report via 10-minute squares. It also expands the required harvester reporting data elements to collect greater information on gear configurations and effort. In addition, the Addendum established a deadline that within five years, states are required to implement 100% harvester reporting, with the prioritization of electronic harvester reporting development during that time. Finally, the Addendum improves the biological sampling requirements by establishing a baseline of ten sampling trips/year, and encourages states with more than 10% of coastwide landings to conduct additional sampling trips.

#### Addendum IV (2022)

Addendum IV expands on reporting improvements by establishing electronic tracking requirements for federally-permitted vessels in the American lobster and Jonah crab fisheries. Specifically, electronic tracking devices will be required for vessels with commercial trap gear area permits for Lobster Conservation Management Areas (LCMAs) 1, 2, 3, 4, 5, and Outer Cape Cod to collect high resolution spatial and temporal effort data.

### **5.0 Fishery Monitoring**

The provisions of Addendum III went into effect January 1, 2019. Specifically, Addendum III requires reporting of additional data elements, the implementation of 100% harvester reporting within five years, and the completion of a minimum of ten sea and/or port sampling trips per year for biological sampling of the lobster/Jonah crab fishery. The Addendum III requirement for commercial harvesters to report their fishing location by 10 minute longitudinal/latitudinal square was implemented in 2021. Types of information collected vary by state, but can include shell width, sex, discards, egg bearing status, cull status, shell hardness, shell disease, and whether landings are whole crabs or parts. *De minimis* states are not required to conduct fishery-independent sampling or port/sea sampling. Data on the states' port and sea sampling in 2023 is summarized in Table 2.

### **6.0 Status of Fishery-Independent Surveys**

The FMP for Jonah crab encourages states to expand current lobster surveys (i.e. trawl surveys, ventless trap surveys, settlement surveys) to collection biological information on Jonah crab. The following outlines the fishery-independent surveys conducted by each state.

#### **Maine**

##### **A. Settlement Survey**

The Maine settlement survey was primarily designed to quantify lobster young-of-year (YOY), but has also collected Jonah crab data from the sites throughout the survey. Jonah crab information collected includes carapace width, sex (when large enough), ovigerous condition, claw status, shell hardness, and location. The density of YOY Jonah crab increased over the past two decades with high values in 2012 and 2016, then declined slightly in recent years (Figure 2). In 2023, density of YOY Jonah crab decreased from 2022 in Statistical Areas 513 and 512, and increased in 511, but all areas remain at lower levels.

## **B. Ventless Trap Survey**

Maine began its Juvenile Lobster Ventless Trap Survey in 2006. Since the beginning of the survey, Jonah crab counts were recorded by the contracted fishermen, but the confidence in early years of this data is low because of the confusion between the two *Cancer* crabs (Jonah crab vs. rock crab) and similar common names. In 2016, the survey began collecting biological data for Jonah crab including carapace width, sex, ovigerous condition, claw status, shell hardness, and location. Since 2016, the survey has sampled 276 sites coast wide using a stratified random design using depth and Statistical Area. In 2023, Jonah crab catch in the survey decreased in Statistical Areas 513 and 511 and increased in area 512, compared to 2022. Concentrations of Jonah crab were highest in Statistical Area 512 and lowest in 513 (Figure 3).

## **C. State Trawl Survey**

The ME/NH Inshore Trawl Survey began in 2000 and is conducted biannually (spring and fall) through a random stratified sampling scheme. Jonah crab data has been collected since 2003. The 2023 spring survey ran from May to June and completed 97 out of 120 scheduled tows. A total of 227 Jonah crab were caught and sampled, with 117 females, 105 males, and 5 unsexed caught and measured. The 2023 fall survey ran from September through October and completed 78 out of 120 scheduled tows; A total of 139 Jonah crab were caught and sampled, with 61 females, 74 males, and 4 non-sexed Jonah crab measured and sampled. Abundance indices for Jonah crab have increased the past two years after declining from a peak in 2016 (Figure 4 and Figure 5).

## ***New Hampshire***

### **A. Settlement Survey**

Since 2009, species information has been collected on Jonah crab in the New Hampshire Fish and Game portion of the American Lobster Settlement Index. The time series of CPUE (#/m<sup>2</sup>) of Jonah crab for all NH sites combined, from 2009 through 2023 shows a general upward trend with a time series high in 2022 (Figure 6).

### **B. Ventless Trap Survey**

Since 2009, New Hampshire Fish and Game has been conducting the coastwide Random Stratified Ventless Trap Survey in state waters (Statistical Area 513). A total of six sites were surveyed twice a month from June through September in 2023. Beginning in 2016, all Jonah crabs were evaluated for sex, carapace width (mm), cull condition, and molt stage. A total of 8 Jonah crab over 8 trips were measured during the 2023 sampling season.

## ***Massachusetts***

### **A. Settlement Survey**

The Juvenile Lobster Suction Survey has consistently identified *Cancer* crabs to genus level since 1995, and Jonah crab have been consistently identified to species in the survey since 2011. The mean number of Jonah crab observed in the MA DMF Settlement Survey in the GOM region has been higher from 2016 through 2023 than it was from 2011 to 2015 (Figure 7).

## **B. Ventless Trap Survey**

The Massachusetts Division of Marine Fisheries (MA DMF) Ventless Trap Survey is conducted in MA territorial waters of NMFS statistical areas 514 and 538. Stratified mean catch per trawl haul (CPUE) for the survey is standardized to a six-pot trawl with three vented and three ventless traps. The index produced from the MA DMF Ventless Trap Survey from area 514 has been increasing since 2012 and reached a time series high in 2023 (Figure 8). Jonah crab are infrequently captured in the area 538 portion of the survey, likely because water temperatures in this region frequently exceed the Jonah crab thermal preference.

## **C. Trawl Survey**

While Jonah crab are common in the deeper, cooler, Federal waters portion of SNE, they are rare in Massachusetts state waters south of Cape Cod, and therefore are infrequently captured by the MA DMF Trawl Survey in this area. Since generally increasing in abundance since the mid-1990's, the last couple of years of the spring and fall surveys in the GOM have generally been near or below time series medians (Figure 9).

## ***Rhode Island***

### **A. Settlement Survey**

The RI DEM lobster YOY Settlement Survey (Suction Sampling) intercepts Jonah crabs. Jonah crab catches in this survey are generally low. In 2023, the Jonah Crab Index was zero crabs per m<sup>2</sup>, compared with the time series (1990-2023) mean of 0.17 crabs per m<sup>2</sup>.

### **B. Ventless Trap Survey**

Since its inception in 2006, the RI Ventless Trap Survey (VTS) has recorded counts of Jonah crab per pot. Carapace width, sex, ovigerous condition, and location data have been collected for all Jonah crabs encountered in the survey since 2015; prior to this, only counts of Jonah crab were recorded. In 2023, the stratified abundance index of Jonah crabs was 2.39 crabs per ventless trap, higher than the time series mean of 1.45 crabs per ventless trap (Figure 10).

### **B. Trawl Survey**

RI DEM has conducted spring and fall trawl surveys since 1979, and a monthly trawl survey since 1990. However, the survey did not begin counting Jonah crab specifically until 2015. Jonah crabs are rarely encountered in this survey, and abundance indices are variable yet low, averaging 0.04 crabs per tow over the time series.

## ***Connecticut***

### **A. Trawl Survey**

Jonah crab abundance is monitored through the Long Island Sound Trawl Survey (LISTS) during the spring (April, May, June) and fall (September and October) cruises, all within NMFS statistical area 611. The survey documents the number of individuals caught and total weight per haul by survey site in Long Island Sound. The LISTS caught one Jonah crab in the fall 2007 survey and two in the fall 2008 survey. Both observations occurred in October at the same trawl site in eastern Long Island Sound. No trawl survey sampling was conducted in 2020 due to



restrictions on field sampling caused by the global COVID-19 pandemic. No Jonah crabs were observed in the spring or fall surveys in 2021-2023.

## ***New York***

### **A. Trawl Survey**

New York initiated a stratified random trawl survey in the near shore ocean waters off the south shore of Long Island in 2018 from the Rockaways to Montauk Point and the New York waters of Block Island Sound. Three sampling cruises were conducted in 2023 during the spring (May, June), and fall (October, November). Twenty-eight stations were sampled during the cruise in May, and twenty-nine stations were sampled during the June cruise. During the fall, twenty-five stations were sampled in October and four stations were sampled in November. A total of thirty-four Jonah crabs were caught. A total of six females were measured ranging from 20mm to 69mm with an average of 46mm. Twenty-seven males were measured ranging from 21mm to 136mm, with an average carapace of 49mm. One unknown Jonah crab was caught that measured 99mm.

## ***New Jersey***

### **A. Trawl Survey**

A fishery-independent Ocean Trawl Survey is conducted from Sandy Hook, NJ to Cape May, NJ each year. The survey stratifies sampling in three depth gradients, inshore (18'-30'), mid-shore (30'-60'), and offshore (60'-90'). The mean CPUE, which is calculated as the sum of the mean weight of Jonah crab collected in each sampling area weighted by the stratum area, has remained low throughout the time series, but increased slightly in 2019. A cruise was not conducted in April 2019. Due to the COVID-19 pandemic, 2020 and 2021 CPUE and indices were not obtained. The 2022 and 2023 observations were higher than the previous three decades. (Figure 11).

## **7.0 Recent and On-Going Research Projects**

### **A. Declawing Study**

NH F&G, Wells National Estuarine Research Reserve, and the University of New Hampshire have been conducting a variety of collaborative research on Jonah crabs since 2014. Two of those studies were published in 2021. Goldstein and Carloni (2021) assessed the implications of live claw removal, and Dorrance et al. (2021) conducted follow-up research on that study to better understand the sublethal effects of declawing. These manuscripts provide estimates of mortality for declawed animals, and information on the effects of claw removal on feeding, movement and mating.

In addition to the above-mentioned publications, an acoustic telemetry study was conducted in 2018 and 2019 by same collaborators to assess the movement patterns of both controls and declawed animals. These data are currently the basis for Maureen Madray's thesis (Furey lab-UNH) and will be finalized in the coming months.

## **B. Growth and Fishery Dependent Data**

In 2019, two collaborative studies between the University of Rhode Island and Rhode Island DEM were published. The first of these was a growth study, which described molt increments for adult females and males and molting seasonality and molt probabilities for adult males in Rhode Island Sound. The second was an interview study in which fifteen in-person interviews were conducted with Jonah crab fishermen to collect their knowledge concerning Jonah crab biology and fishery characteristics. The interviews provided insight into aspects of the species biology and life history that have not been characterized in the literature (e.g., seasonal distribution patterns); identified topics requiring further study (e.g., stock structure and spawning seasonality); and highlighted predominant concerns related to fishery management (e.g., inshore-offshore fleet dynamics).

New Hampshire Fish and Game, Wells National Estuarine Research Reserve and the University of New Hampshire conducted research on growth rates of crabs held at ambient and controlled temperatures for sizes ranging from 5 mm (YOY) to 100 mm. These data are currently being analyzed, and will be available for population assessment purposes.

## **C. CFRF Research Fleet**

The Commercial Fisheries Research Foundation (CFRF) has expanded its lobster commercial research fleet to sample Jonah crab. Biological data collected include carapace width, sex, shell hardness, egg status, and disposition. To date 135,964 Jonah crabs have been sampled through the program<sup>1</sup>.

## **8.0 State Compliance**

All states have implemented the provisions of the Jonah Crab FMP and associated addenda. The implementation deadline for the Jonah Crab FMP was June 1, 2016; the implementation deadline for Addendum I was January 1, 2017; the implementation deadline for Addendum II was January 1, 2018; and the implementation deadline for Addendum III was January 1, 2019 (with the exception of the 10-minute square reporting requirement). Reporting at the 10-minute square level was implemented in 2021.

## **9.0 De Minimis Requests**

The states of Delaware, Maryland, and Virginia, have requested *de minimis* status. According to the Jonah crab FMP, states may qualify for *de minimis* status if, for the preceding three years for which data are available, their average commercial landings (by weight) constitute less than 1% of the average coastwide commercial catch. Delaware, Maryland, and Virginia meet the *de minimis* requirement.

## **10.0 Research Recommendations**

Research recommendations made by the Stock Assessment Subcommittee and Peer Review Panel in the 2023 Jonah crab benchmark stock assessment are summarized below.

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<sup>1</sup> <https://www.cfrfoundation.org/jonah-crab-lobster-research-fleet>

### ***High Priority***

- Surveys to track abundance in SNE during all life stages (e.g., settlement, recruitment, abundance) for future stock assessments and potential management advice.
- Research to provide a more comprehensive understanding of recruitment dynamics, including tracking of spatiotemporal settlement dynamics and the source of recruitment to offshore SNE, to inform development of Jonah crab settlement surveys.
- Appropriate survey methodologies need to be researched to track abundance of Jonah crab. Behavioral interactions with survey gear need to be better understood. Video surveys are recommended to examine these interactions. Video surveys could also be used for snapshot estimates of total stock size (i.e., swept-area biomass) that could be used to gain a better understanding on exploitation levels.
- Female migration pathways/seasonality and distribution needs to be researched to help understand movement and inform connectivity. Ventless trap surveys (state-run and windfarm impact) offer a potential data set to explore interannual variability in distribution.
- Information on larval duration in the field, mortality, and dispersal are needed to better understand possible connectivity. Spawning female distribution information would supplement efforts to model these processes. Evaluate larval data sets for species identification and to explore abundance, seasonality, and interannual variability.
- Inter-molt duration of adult crabs is currently unknown and growth increment data for mature crabs is limited. There are no growth data from offshore SNE where the bulk of the fishery occurs and differences in growth between regions are unknown.
- Research growth mechanisms for both sexes (e.g., potential for terminal molt, lack of growth associated with molting, high natural mortality for adults) to explain lack of exploitation signal (i.e., lack of size structure change) in available data sets.
- Increase and improve consistency of fisheries-dependent monitoring and biosampling. Sampling intensity by statistical area should be based on landings.
- Continue to improve accuracy of commercial reporting to improve quantification of effort in the directed and mixed-crustacean fisheries. Evaluate new spatial to better understand spatial dynamics of the fishery.
- Study the effect of temperature on Jonah crab behavior/activity.
- Studies should be done to identify and understand drivers of ecosystem/environmental drivers of Jonah crab population dynamics.
- Determine how to interpret fisheries-dependent data considering interactions between fishery response to abundance, economic drivers, and lobster fishery dynamics.

### ***Moderate Priority***

- Explore historical data sets from the scallop dredge survey and video surveys like HabCam to understand habitat use/suitability, abundance, distribution, and to inform potential covariates for catchability effects.
- Analyze food habits data, with an emphasis on offshore areas, to better understand predation of Jonah crab and as a potential measure of abundance and distribution.

- Evaluate evidence for a defined stock-recruit relationship or lack thereof. If lack of evidence, identify recruitment drivers and mechanisms of population abundance change.

### **Low Priority**

- Information should be collected to help delineate stock boundaries and understand possible connectivity, with an emphasis on the GOM/SNE boundary.
- Reproductive studies pertaining to male-female spawning size ratios, the possibility of successful spawning by physiologically mature but morphometrically immature male crabs, and potential for sperm limitations should be conducted.
- If improved abundance data with higher encounter rates becomes available, cohort tracking analyses should be conducted across and within surveys to better understand if surveys are tracking true abundance signals and provide information on growth, mortality, and other demographic factors.
- The development of aging methods or determination of the mechanism responsible for the suspected annuli formation found in the gastric mill should be explored.

### **11.0 Plan Review Team Recommendations**

The following are recommendations and comments from the Plan Review Team:

- The PRT recommends the Board approve the *de minimis* requests of DE, MD, and VA.
- The PRT notes that MA has been unable to meet the August 1 deadline for compliance reports for the last several years.
- Rhode Island, Connecticut, and New Jersey were not able to complete the sea and/or port sampling required by the FMP. Rhode Island completed four out of ten required trips, and Connecticut and New Jersey did not complete any sampling. These states have noted concerns with staff availability, funding, and lack of agreement by fishermen, which have contributed to the inability to complete the required sampling trips.
- The 2023 Benchmark Stock Assessment recommended that fisheries-dependent monitoring and biosampling be increased and improved, with sampling intensity by statistical area based on landings. The PRT recommends the TC provide recommendations on adequate sampling numbers by statistical area.

## 12.0 Tables

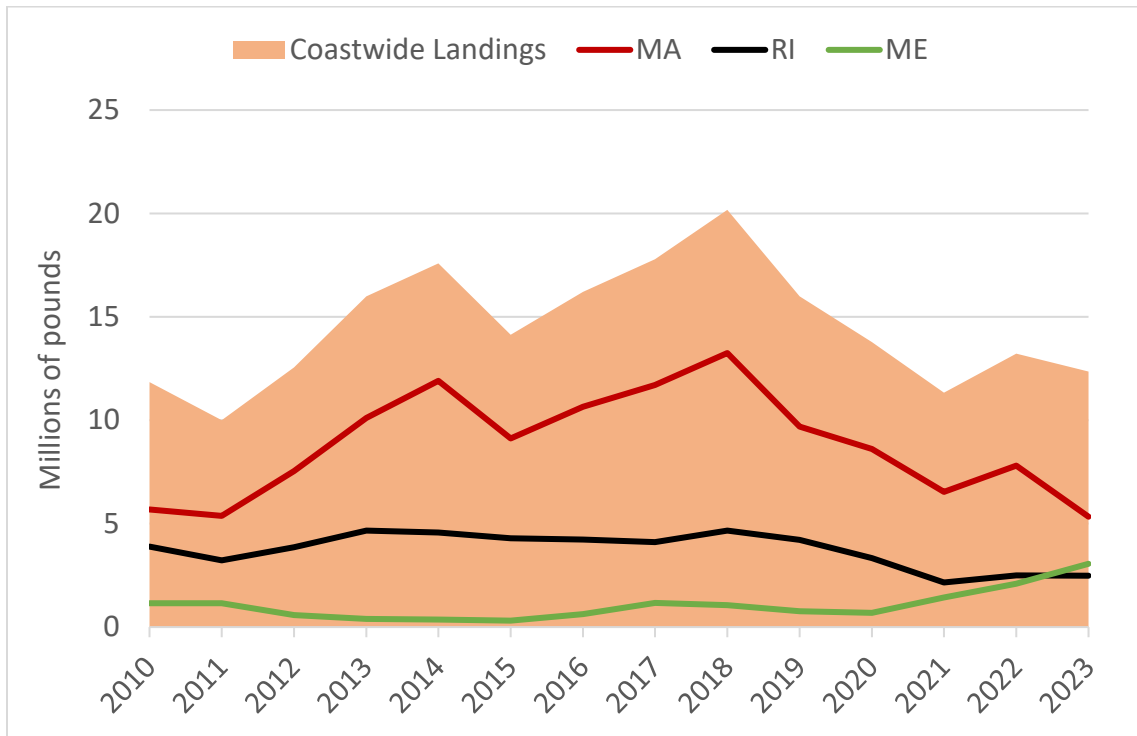
**Table 1.** Landings (in pounds) of Jonah crab by the states of Maine through Virginia. 2010-2022 landings were provided by ACCSP based on state data submissions. 2023 landings were submitted by the states as a part of the compliance reports and should be considered preliminary. *C= confidential data*

	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	Total
<b>2010</b>	1,154,564	C	5,689,431	3,899,239	C	995,059	84,645		23,909	C	11,846,847
<b>2011</b>	1,152,651	C	5,381,140	3,221,119	C	69,440	71,632		104,838	C	10,000,820
<b>2012</b>	586,449	C	7,540,545	3,865,978	2,349	468,364	86,736		C	C	12,550,421
<b>2013</b>	391,690	340,751	10,117,595	4,665,489	51,462	407,755	16,425		C	C	15,991,166
<b>2014</b>	361,500	404,703	11,904,649	4,568,400	49,998	95,855	48,008		154,764	C	17,587,878
<b>2015</b>	312,063	C	9,128,876	4,298,894	C	215,140	88,283	C	88,467	C	14,131,722
<b>2016</b>	625,240	150,971	10,661,416	4,232,785	C	177,425	279,249	C	64,552	C	16,201,295
<b>2017</b>	1,169,474	114,155	11,698,447	4,111,281	C	176,424	447,048	C	75,991	C	17,792,819
<b>2018</b>	1,061,799	22,434	13,250,803	4,665,701	C	231,705	880,192	C	60,932	C	20,173,884
<b>2019</b>	763,807	70,818	9,698,145	4,222,305	C	125,391	1,061,194	C	47,829	C	15,989,489
<b>2020</b>	696,309	31,658	8,605,007	3,331,552	C	105,841	975,522	C	35,606	C	13,781,495
<b>2021</b>	1,427,245	123,729	6,539,131	2,157,071	C	72,066	976,248	C	34,327	C	11,329,815
<b>2022</b>	2,090,924	295,529	7,803,736	2,504,895	C	41,816	493,179	C	C	C	13,230,080
<b>2023</b>	3,060,784	357,829	5,694,551	2,483,156	C	259,876	863,583	C	C	C	12,719,779

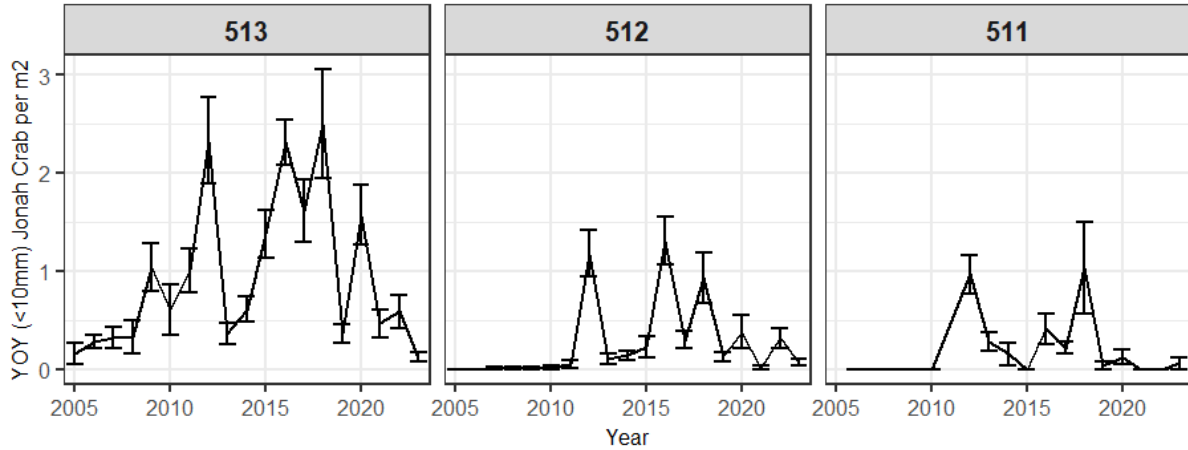
**Table 2. Fishery-dependent sampling (port/sea) by state in 2023. Delaware, Maryland, and Virginia are not required to complete fishery-dependent monitoring.**

	Sea Sampling Trips	# of Samples	Port Sampling Trips	# of Samples
ME	19	3,489	0	0
NH	14	128	4	399
MA	0	0	10	6,689
RI	0	0	4	863
CT	0	0	0	0
NY	0	0	16	755
NJ	0	0	0	0
DE	None	None	None	None
MD				
VA				
<b>Total</b>	<b>33</b>	<b>3,617</b>	<b>34</b>	<b>8,706</b>

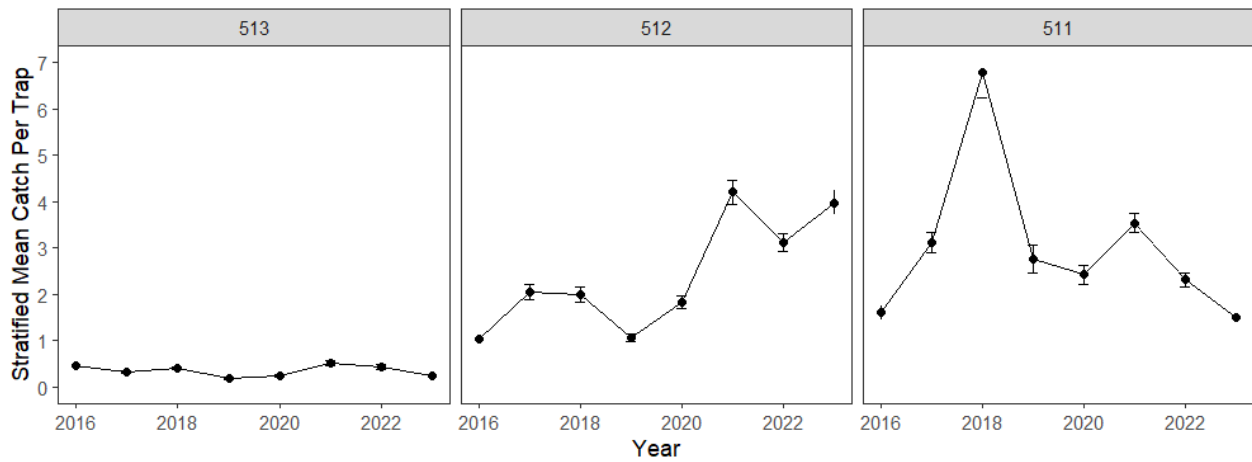
**13.0 Figures**



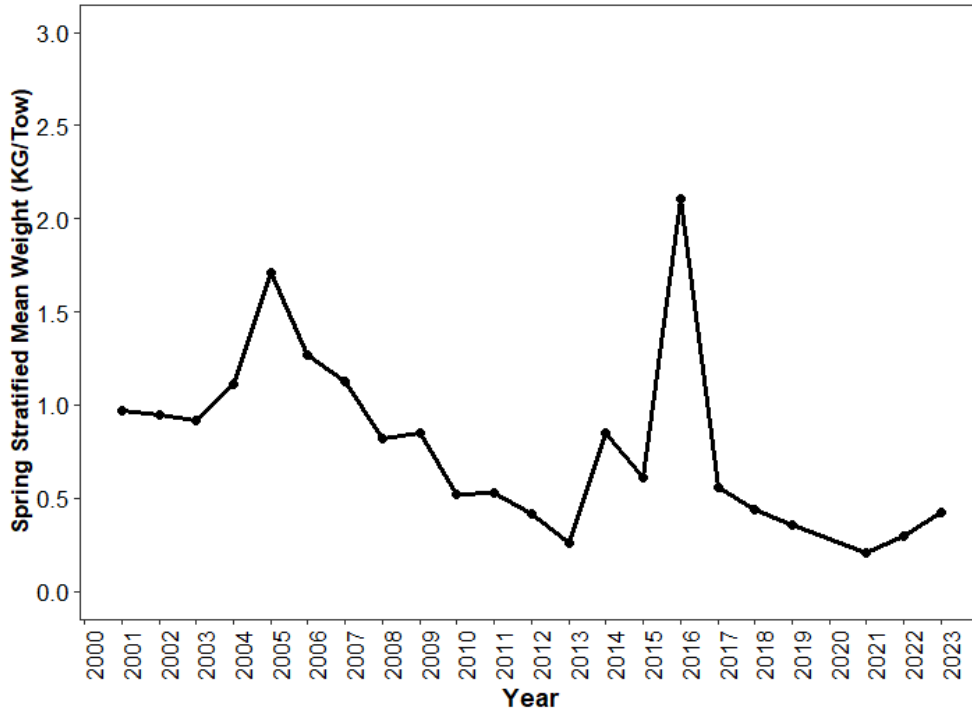
**Figure 1. Coastwide commercial Jonah crab landings, 2010-2023. Data from 2010-2022 are from the ACCSP Data Warehouse, and 2023 landings are based on state compliance reports.**



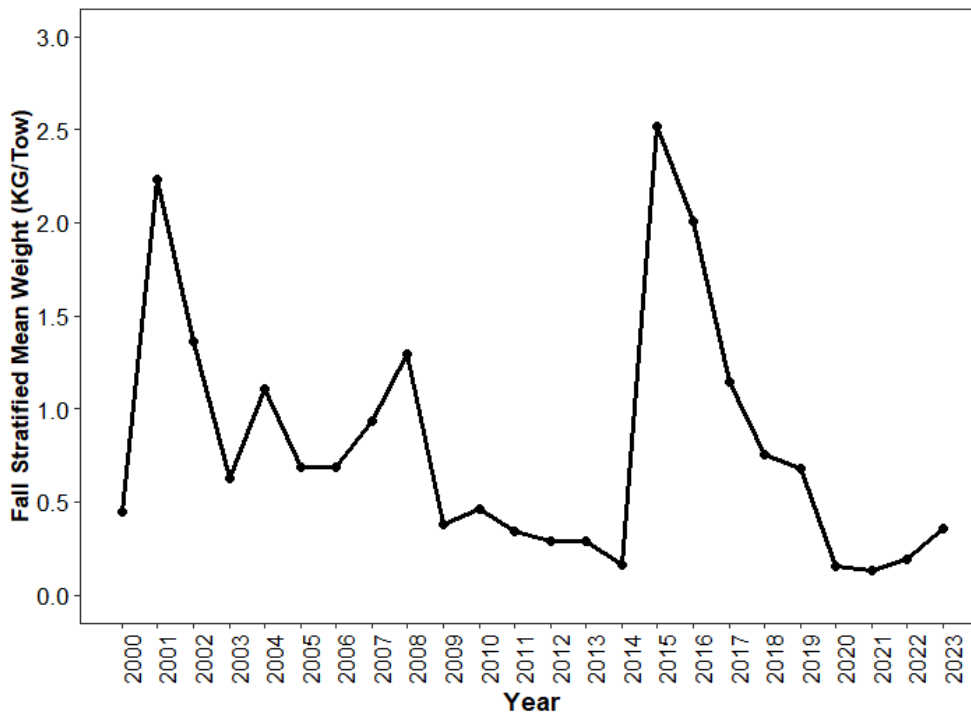
**Figure 2. Density of YOY (<10mm carapace width) Jonah crab over time in the Maine Settlement Survey by statistical area.**



**Figure 3. Stratified mean of Jonah crab from Maine Ventless Trap Survey 2016-2023. Standard error shown.**

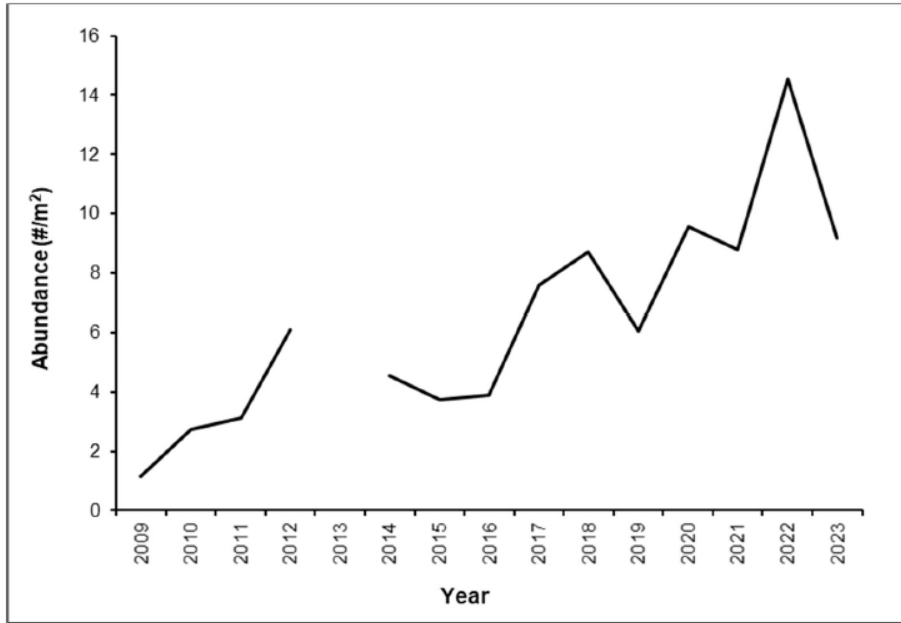


**Figure 4. Stratified mean weight (kg/tow) of Jonah crab for Spring Maine-New Hampshire Inshore Trawl Survey 2001-2023.**



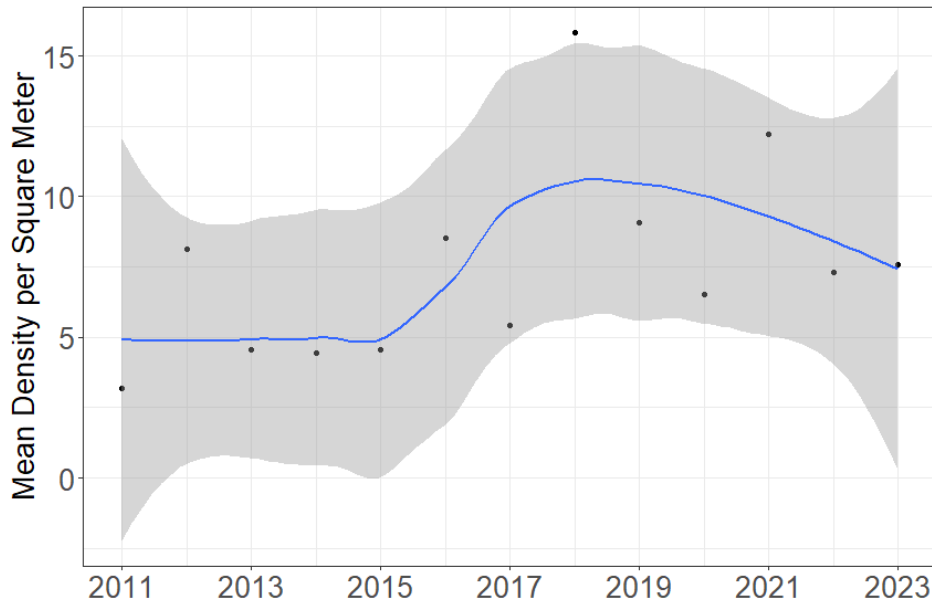
**Figure 5. Stratified mean weight (kg/tow) of Jonah crab for Fall Maine-New Hampshire Inshore Trawl Survey 2000-2023.**



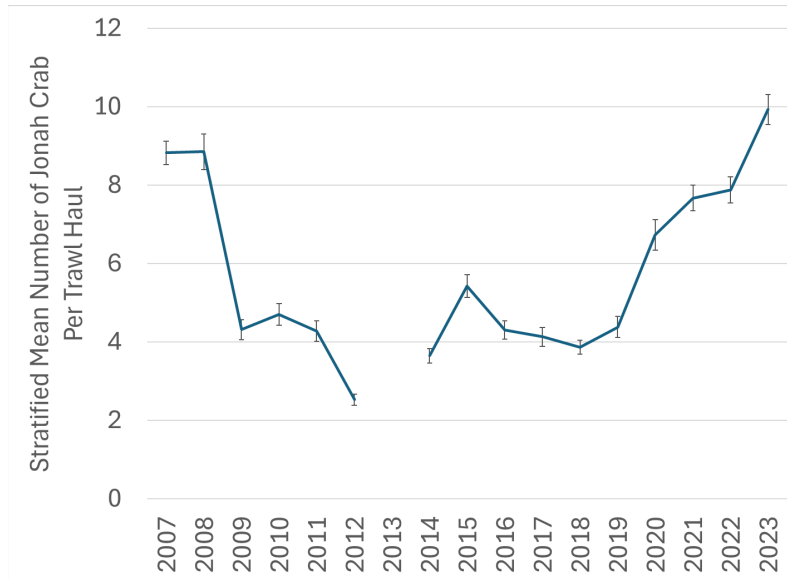


\* No samples collected in 2013

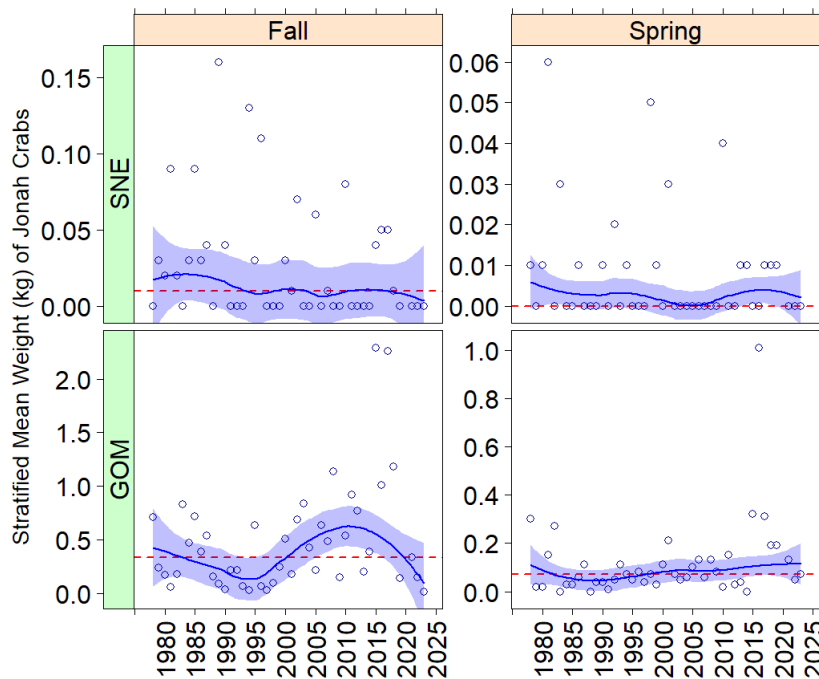
**Figure 6. Catch per unit effort (#/m<sup>2</sup>) of Jonah crab during the American Lobster Settlement Index Survey, in New Hampshire, from 2009 through 2023.**



**Figure 7. Mean number of Jonah crab per square meter from the MA DMF Settlement Survey from the Gulf of Maine (GOM) region. Black dots are annual means, blue line is a Loess smoother, gray area is confidence interval around the Loess smoother.**



**Figure 8. Mean number of Jonah crabs per trawl haul from ventless traps from GOM region of the MA DMF Ventless Trap Survey (standardized to a 6-pot trawl with three vented and three ventless traps). Error bars are two times the standard error. The survey was not conducted in 2013 due to a gap in funding.**



**Figure 9. Stratified mean weight (kg) of Jonah crab from the MA DMF Trawl Survey. The left column shows the fall surveys, the right columns show the spring surveys. Southern New England (SNE) is on the top row, Gulf of Maine (GOM) is on the bottom. Red dashed line is the time series median. Blue line is a trend line (Loess smoother), and the blue shaded area is the confidence interval around the trend line. The survey was not conducted in 2020 due to the Covid-19 pandemic.**

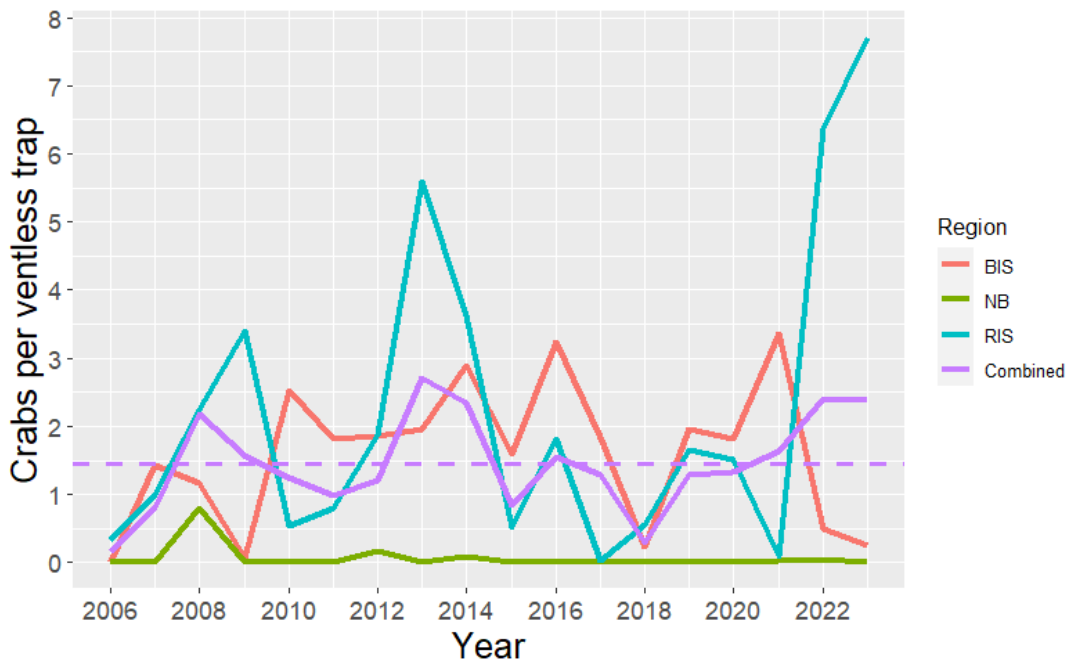


Figure 10. Rhode Island ventless trap survey index of Jonah crab abundance by region: Narragansett Bay (NB), Rhode Island Sound (RIS), and Block Island Sound (BIS). Time series mean for the combined region is presented as a dashed purple line.

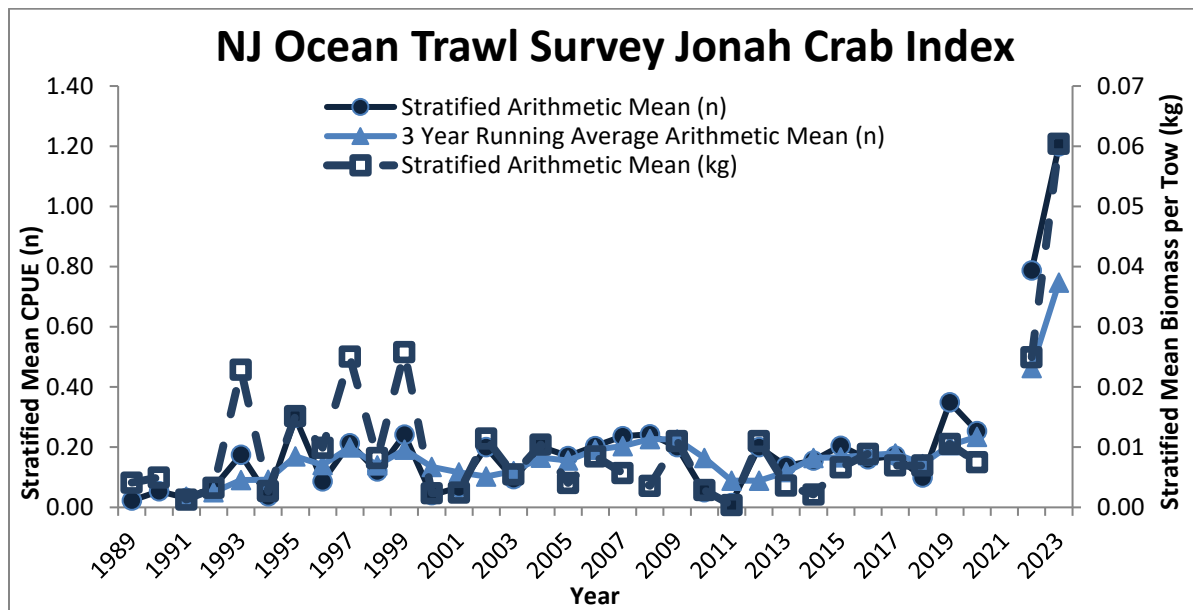


Figure 11. Stratified mean CPUE of all Jonah crab collected aboard the NJDFW Ocean Trawl Survey. The survey stratifies sampling in three depth gradients, inshore (18'-30'), mid-shore (30'-60'), offshore (60'-90'). The mean CPUE was calculated as the sum of the mean weight (in kg) of Jonah crab per size class collected in each sampling area weighted by the stratum area. \*NOTE: No April 2019 Survey was conducted due to Research vessel mechanical issues. Due to the COVID-19 pandemic, Apr-Oct 2020 and 2021 CPUE and indices were not obtained.

NMFS Jonah crab bottom trawl survey index for the NEFSC Survey Area

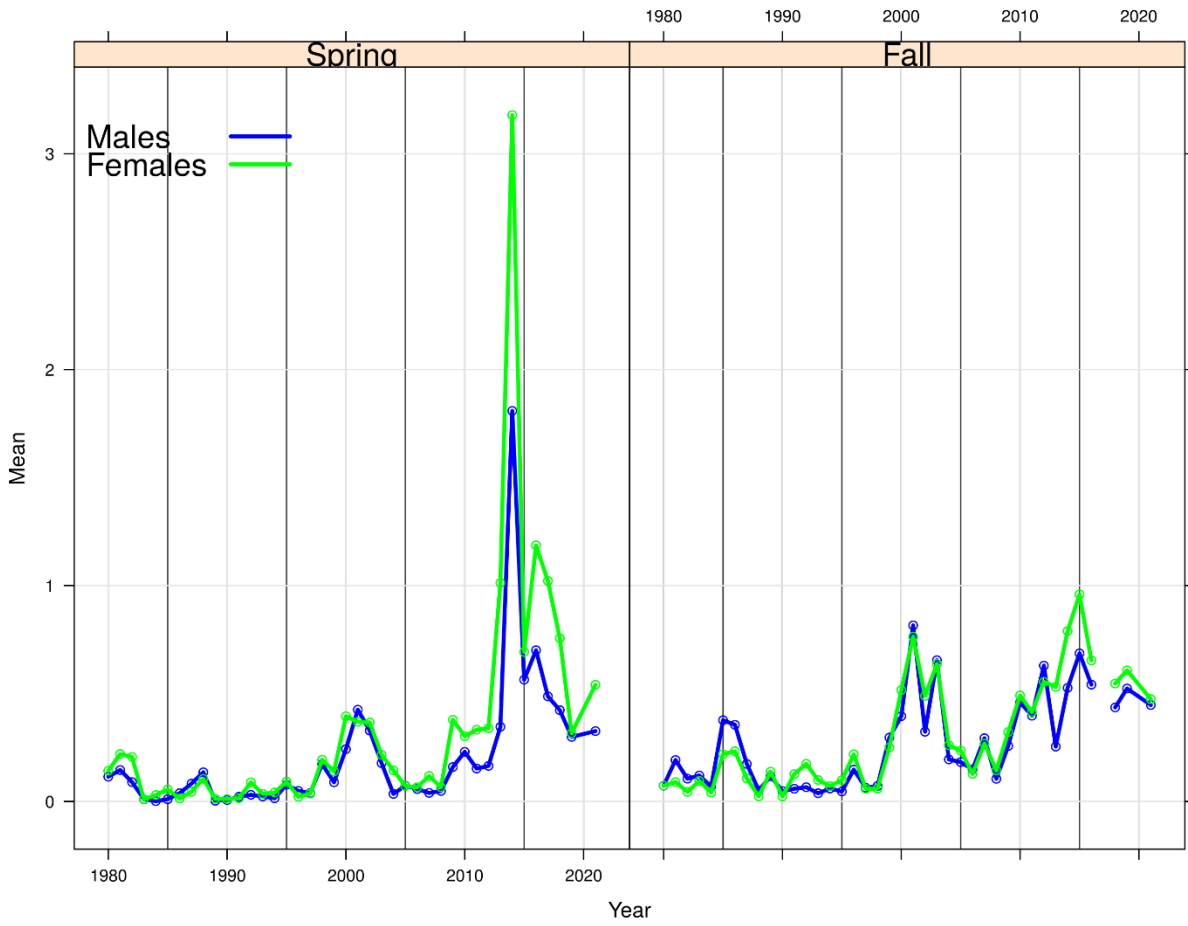


Figure 12. NMFS Jonah Crab index (mean number per tow) from the bottom trawl survey for the NEFSC Survey Area, through fall 2021. There was no survey conducted in 2020 due to the COVID-19 pandemic. 2022 and 2023 data are not yet available.